

# A LANDOWNER'S GUIDE TO SAND & GRAVEL REMOVAL



*Sand and gravel* are important natural features in Missouri streams. They can be good or bad news for Missouri landowners. Some use them to cover farm roads; others curse them for causing stream channel problems. However, we haven't always had large amounts of sand and gravel in many of our streams. Over the last century, deep pools, stable streambanks, and narrow stream channels slowly changed to shallow, wide, eroding streams; the "old swimming hole" was often buried under a mound of sand and gravel. Through it all, landowners tried to deal with these changes.

*The health of Missouri streams depends on you. Remember, sand and gravel removal can cause stream problems. Please follow these guidelines to reduce harmful effects when sand and gravel are removed. For more advice on sand and gravel removal, contact your nearest MDC regional office.*

# WHAT CAUSES SAND AND GRAVEL PROBLEMS?

The causes of our sand and gravel problems began about 150 years ago and continue today. As we changed the Missouri landscape, we disturbed the natural balance of our streams. Different types of land use changes have taken place on different parts of the landscape, and at different times, so pointing to just one cause of our sand and gravel problems is not possible.

In the 1800s, Missourians began clearing bottomlands to build homes and roads, raise crops, and graze cattle. In northern and western Missouri, farmers plowed prairie sod to raise crops and feed a growing nation. Large tracts of Ozark hardwood timber were harvested for lumber and railroad ties. These changes added some sand and gravel to our streams, but much more was to come.

In the early to mid 1900s, burning, plowing, and overgrazing of hillsides removed vegetation that controlled runoff and held soil in place. Farming practices of the time did not conserve the soil and left the ground unprotected. Streamside forests that protected streambanks were frequently cleared for more farm and pasture land. Channels were straightened increasing the erosive power of floods. Cities and towns grew, causing floods to be larger and occur more often. Another significant



A stream channel filled with sand or gravel is a common sight in Missouri, the result of over a century of disturbances.

disturbance of Ozark streams was caused by open range livestock that concentrated in valley bottoms and destroyed vegetation in and along stream channels.

The combined effects of all these landscape changes have caused increased runoff and made channels more prone to erosion. The channel erosion caused by these changes has released huge amounts of sand and gravel stored for thousands of years, or more, in stream valleys and streambanks.

In many ways we have become better stewards of our watersheds and streams during the last 50 years. Though we still do things to disturb our streams, good soil conservation now plays a large part in farming and timber harvesting

practices. Some streamside forests are starting to grow back, and stormwater management in cities is improving. Unfortunately, our streams are still adjusting to all the changes of the past two centuries.

It took us a long time to cause sand and gravel problems, and it will take a long time for our streams to recover. But a long journey always begins with a single step. By following the tools and guidelines in this brochure, you can help in the recovery of Missouri streams for future generations to enjoy.

# WHAT CAN LANDOWNERS DO?

**W**e still face problems that began over a century ago. As a landowner, you must work with unstable streams that erode streambanks and deposit sand and gravel on fields and other undesirable places during floods. Some actions landowners can take to save their valuable soil and farmlands are:

## **Practice good soil conservation.**

Good soil conservation not only keeps topsoil on agricultural fields, it also keeps it from washing into streams and being added to the sand and gravel already there. Sound conservation plans should be developed and implemented for all of your lands, agricultural and nonagricultural. Your local Soil and Water Conservation District (SWCD) or Natural Resources Conservation

Service (NRCS) office can provide information and assistance in soil conservation planning.

## **Use streambank stabilization structures.**

Landowners often experience problems with accelerated streambank erosion. This is often a symptom of another problem. Not all streambank erosion problems are easily solved but there are proven and practical techniques for many common bank erosion problems.

Dozing material out of the channel and packing it on the eroding bank is not a solution. This loose material is easily eroded and carried downstream by flood waters and deposited where it is not wanted, often causing a problem for a neighbor. Realignment of the channel away from the eroding

bank is not a good idea. It may seem like a quick fix, but this changes the slope of the channel and results in more erosion at the site and increased deposition of material downstream. For advice and assistance with bank erosion problems, contact your local Missouri Department of Conservation (MDC) office.

## **Maintain timbered buffer strips along streams.**

Streamside trees keep banks stable and, by slowing flood waters, cause sand and gravel to drop out in this buffer strip rather than on bottomland fields. Consult your local MDC regional office for advice and information on planting and managing streamside trees.

## **Remove sand and gravel carefully.**

When done properly, sand and gravel can be removed with minimal harm to the stream and can allow you to use some of this material on your land. However, removal does not address the causes of sand and gravel problems in the stream. Improper or excessive removal of sand and gravel can create stream channel and economic problems for landowners upstream and downstream from the removal area. If a removal technique is chosen, it should be conducted with stream stability in mind. To ensure minimal impacts to others and avoid damaging streams, carefully follow the suggested guidelines listed on back.



Removing gravel from below the water line can increase stream instability and destroy aquatic habitats.

# GUIDELINES FOR SAND AND GRAVEL REMOVAL:

- ✓ Remove sand and gravel only from bars that are loosely packed. Bars covered with larger-sized materials that are well-packed or vegetated are usually stable and should not be disturbed. MDC technical staff can help determine places on your land where gravel removal will minimize harm to the stream.
- ✓ Remove gravel above the water line and leave a 20-foot buffer of undisturbed material between the normal water line and the excavation area.
- ✓ Avoid removing sand and gravel within 20 feet of streamside vegetation. Vegetation holds gravel and soil, keeping bars and banks in place.
- ✓ Do not remove gravel from riffles (shoals) because this may increase erosion of the stream bed and lower water levels in upstream pools. Riffles are very important to stream stability and are a major source of food and oxygen for aquatic life.
- ✓ Sand and gravel removal should take place before March 15 and after June 15 to avoid harming spawning fish and their habitat. Removal should be avoided in areas considered habitat for threatened or endangered species.
- ✓ Do not wash sand or gravel in the stream channel. If you must wash sand or gravel, use a settling basin and wash your material outside the stream to avoid polluting the water with sediment.



Gravel is best removed from loosely packed bars above the water line. This decreases the potential for increased erosion and still allows a good source of sand and gravel.

- ✓ Do not stockpile gravel within the stream channel. If you must stockpile gravel, do it outside the stream channel. Contact the U.S. Army Corps of Engineers for guidelines and applicable permit requirements.
- ✓ When you finish, smooth the removal area to minimize stream bed erosion and other stream channel problems.
- ✓ Use approved streambank erosion control structures and avoid channel straightening or packing sand and gravel on eroding streambanks.
- ✓ Avoid using vehicles and heavy equipment in the water. If you must cross the stream, drive vehicles at right angles to stream flow.
- ✓ Keep fuel, oil, and other wastes out of the stream.
- ✓ Within 30 days of the removal of excavation equipment from the site, streambank areas disturbed by the operation should be revegetated or otherwise protected from erosion.
- ✓ Make sure you have the appropriate permits and comply with all applicable laws. Stream work and sand and gravel removal may require permits from local, state, or federal agencies such as the Army Corps of Engineers or the Missouri Department of Natural Resources.

For more information, or for the location of your nearest MDC regional office, contact:  
Stream Unit  
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